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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,527	03/17/2004	David A. Litton	EH-10433B(02-217-2)	5484
34704	7590	06/06/2005	EXAMINER	
BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510			MCNEIL, JENNIFER C	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/803,527

Applicant(s)

LITTON ET AL.

Examiner

Jennifer C. McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 14-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,730,422 (Litton et al) in view of Subramanian (US 6,258,467). Litton teaches a thermal barrier coating comprising substantially the same composition as that of the instant claims. Litton does not expressly teach application of the thermal barrier coating to a ceramic substrate. Subramanian teaches a thermal barrier coating of similar composition (zirconia based oxides) to that of Litton and teaches that it may be applied to metal and ceramic substrates alike. Both references are directed to thermal barrier coatings for turbine components. It would have been obvious at the time of the invention to apply the coating of Litton to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

Claims 13, 25-44 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7-26, and 38 of copending Application No. 10/641,585 in view of Subramanian (US 6,258,467). US App '585 teaches a thermal barrier coating comprising substantially the same composition as that of the instant claims. US App '585 does not expressly teach application of the thermal barrier coating to a ceramic substrate. Subramanian teaches a thermal barrier coating of similar composition (zirconia based oxides) to that of the application and teaches that it may be applied to metal and ceramic substrates alike. It would have been obvious at the time of the invention to apply the coating of application to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

This is a provisional obviousness-type double patenting rejection.

Claim Objections

Claim 25 is objected to because of the following informalities: Should claim 25 depend from claim 1 and not from claim 22?

Claim 30 is objected to because of the following: Should ceria be a choice for the second oxide, since this would make possible the entire coating to be made of ceria? Appropriate correction is required.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6-12, 22, 23, 25, 26, 28, 36, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Subramanian (US 6,258,467). Subramanian teaches a thermal barrier comprising an ABO_3 combined with zirconia or hafnia, wherein A is La, Pr, Nd, Eu, Tb, Er, or mixtures thereof. The coating may be applied to a ceramic substrate (col. 4, lines 45-50). The ranges of the instant claims are considered to overlap with the composition of Subramanian. The amount of the lanthanide oxide may be about 33 mol% or less (see conversion in the Example). Regarding claims 22, 23, 25, 26, and 28, Subramanian clearly teaches that combinations of the oxides may be present.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 3-5, 45, 49, 50, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6,258,467) in view of Lee (US 6,759,151). Subramanian teaches a ceramic substrate with a thermal barrier coating but does not give specific examples of the substrate composition. Lee teaches a turbine engine component comprising a ceramic substrate and having a coating thereon comprising oxides. The substrate may comprise SiC, SiN, and other ceramics. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Lee as the substrate of Subramanian as the ceramic substrates of Lee are clearly taught to be useful as turbine engine components and are also shown to be compatible with oxide coatings. Regarding claims 45, 49, and 50, an intermediate layer (considered a bond coat) of mullite or BSAS may be provided. Regarding claims 54 and 55, multiple interlayers may be used and are considered to be functionally graded as they all differ slightly in thermal expansion.

Claims 36, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rickerby et al (US 6,025,078) in view of Subramanian (US 6,258,467). Rickerby teaches a metallic article with a thermal barrier coating thereon. The coating may comprise 4-20 wt% ceria, 4-25 mol% europia, and the balance zirconia. Regarding claim 38, the coating may comprise 4-25 mol% europia or erbia, and 4-20 wt% Scandia, with the balance zirconia. Rickerby does not teach additional articles the coating may be applied to. Subramanian teaches a thermal barrier coating of similar composition (zirconia based oxides) to that of Rickerby and teaches that it may be applied to metal and ceramic substrates alike. It would have been obvious at the time of

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the invention to apply the coating of Rickerby to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

Claims 27, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigney et al (US 6,586,115) in view of Subramanian (US 6,258,467). Rigney teaches a thermal barrier coating that may comprise zirconia, in combination with lanthana (5-22.5 wt%) and yttria (up to 3 wt%), or zirconia in combination with ceria at 1-30 wt%, and MgO at 0.8-3.6 wt%. These ranges are considered to overlap with that of the instant claims. Rigney does not teach additional articles the coating may be applied to. Subramanian teaches a thermal barrier coating of similar composition (oxides) to that of Rigney and teaches that it may be applied to metal and ceramic substrates alike. It would have been obvious at the time of the invention to apply the coating of Rigney to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

Claims 12, 25, 27-30, 36, and 38-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al (US 6,812,176) in view of Subramanian (US 6,258,467). Zhu teaches a thermal barrier coating comprising zirconia or hafnia, and including a primary stabilizer oxide, a group A oxide, and a group B oxide. The group A oxide, and the primary stabilizer include rare earth oxides and may be present in amounts of 0.5-25 mol% ad 2-25 mol%

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respectively. Regarding claims 28 and 29, erbia, europia, and rare earth oxides may be present. Regarding claim 40, the primary oxide may be dysprosia, and the group A oxide may be Scandia or magnesia. Regarding claim 41, the group A oxide may be ytterbia, and the group B oxide may be samaria. Regarding claim 44, the Group B oxide may be gadolinia and the group A oxide may be a rare earth oxide. Zhu does not teach additional articles the coating may be applied to. Subramanian teaches a thermal barrier coating of similar composition (oxides) to that of Zhu and teaches that it may be applied to metal and ceramic substrates alike. It would have been obvious at the time of the invention to apply the coating of Zhu to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kushner et al (US 5,059,095) in view of Subramanian (US 6,258,467). Kushner teaches a coating comprising zirconia stabilized with 25 wt% ceria, which corresponds to a coating comprising 19.2 mol% ceria, and 80.8 mol% zirconia. The value of ceria is substantially close to that of the instant claims that one of ordinary skill would have expected compositions that are in such close proportions to those in prior art to be prima facie obvious, and to have same properties (*Titanium Metals Corp.*, 227 USPQ 773 (CA FC 1985)). Kushner does not teach additional articles the coating may be applied to. Subramanian teaches a thermal barrier coating of similar composition (oxides) to that of Kushner and teaches that it may be applied to metal and ceramic substrates alike. It would have been obvious at the time of the invention to apply the coating of

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Kushner to a ceramic substrate as taught by Subramanian, as it is clearly taught that metal as well as ceramic substrates may be used as turbine components and coated with oxide thermal barrier coatings.

Claims 3-5, and 45-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6,258,467) in view of Lee et al (US 6,733,908). Subramanian teaches a ceramic substrate with a thermal barrier coating but does not give specific examples of the substrate composition. Lee teaches a turbine engine component comprising a ceramic substrate and having a coating thereon comprising oxides. Lee teaches an intermediate layer (considered a bond coat) of a rare earth disilicate. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Lee as the substrate of Subramanian as the ceramic substrates of Lee are clearly taught to be useful as turbine engine components and are also shown to be compatible with oxide coatings. Regarding claims 45, 49, and 50, an intermediate layer (considered a bond coat) of mullite, or BSAS may be provided. Regarding claims 46, and 51-53, it would have been obvious to one of ordinary skill to use a bond coat with a thermal expansion similar to the outer layer, to prevent cracking when exposed to extreme heat. Regarding claims 54 and 55, multiple interlayers may be used and are considered to be functionally graded as they all differ slightly in thermal expansion.

Claims 3-5, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6,258,467) in view of Saak et al (US 6,844,075). Subramanian teaches a ceramic

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substrate with a thermal barrier coating but does not give specific examples of the substrate composition. Saak teaches a turbine engine component comprising a ceramic substrate and having a coating thereon comprising oxides. Saak teaches an intermediate layer (considered a bond coat) of tantalum oxide. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Saak as the substrate of Subramanian as the ceramic substrates of Saak are clearly taught to be useful as turbine engine components and are also shown to be compatible with oxide coatings.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is 571-272-1540. The examiner can normally be reached on 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jennifer McNeil
May 30, 2005